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EXAMINER	
ZERVIGON, RUDY	

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Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 07-01)

Office Action Summary	Application No. 09/667,770	Applicant(s) KOMINO ET AL.	
	Examiner Rudy Zervigon	Art Unit 1763	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 March 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *2-4,7,11-15,21,23-25,27 and 29-46* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *2-4,7,11-15,21,23-25,27 and 29-46* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2. Claims 2, 14, 25, 29, 30, 31, 37, 40, 41, and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Heimanson et al (USPat. 5,775,416) in view of Gilchrist et al (USPat. 5,846,375). Heimanson teaches an electrode structure ("chuck", 20) with a conductor unit (24, "stainless steel"; column 3, lines 24-25) and placement table (Figure 1) having a heater unit (28) therein; a cooling block (34) joined to a conductor unit and having a cooling jacket (38) which cools said electrode unit; a heat transfer space (50) provided on at least one of opposite surfaces of the conductor unit (Figure 1) and said cooling block; and conductor-side heat transfer gas supply means (92, 72, 76, 84) for supplying a heat transfer gas to the heat transfer space. Heimanson further teaches a center of the placement table held by a column (transmission column of 108), where the column is shown connected to the cooling block via a heat conducting member (56). Heimanson further teaches a chuck (20/56, Figure 2; column 3, line 55 – column 4, line 3) and chuck-side heat transfer gas supply (30, Fig.1). Heimanson further teaches pressure sensors (68, 78; Figure 1; column 4, line 17) and controller (92) for pressure setting (column 4, lines 16-35). Heimanson further teaches a heater unit (114, Figure 4; column 5, lines 9-33) divided into concentric zones (118, 120) controlled independently (122, 124) and seal members (44, Figure 1,3).

Heimanson et al does not teach a heat transfer space (50) formed by a concentric or spiral groove. Further, Heimanson et al does not teach a high-frequency source applying a high-frequency voltage to Heimanson's conducting unit.

Gilchrist teaches an electrode unit (15, Figure 1) that interfaces with the substrate, and specifically teaches a labyrinth transfer space (32A-D; Figure 1) formed by concentric (Figure 2, 5) grooves. The heat transfer space is divided into concentric zones (32A-D; Figure 1) controllable on an individual basis (column 4, lines 35-45). Further, Gilchrist teaches a high-frequency source (30) applying a high-frequency voltage to an electrode unit (14).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to form Heimanson's heat transfer space as Gilchrist's labyrinth heat transfer space thereby producing a heat transfer space of a groove on at least two adjoining surfaces, and use a high-frequency source to apply a high-frequency voltage to Heimanson's conducting unit as taught by Gilchrist.

Motivation to form Heimanson's heat transfer space as Gilchrist's labyrinth heat transfer space and use a high-frequency source to apply a high-frequency voltage to Heimanson's conducting unit as taught by Gilchrist is to optimize temperature control for a particular etching or deposition process as taught by Gilchrist (column 4, lines 49-54) and to increase plasma ionization with the high-frequency voltage. Further, it would be obvious to those of ordinary skill in the art to optimize the operation of the claimed invention (In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980); In re Hoeschele , 406 F.2d 1403, 160 USPQ 809 (CCPA 1969); Merck & Co. Inc . v. Biocraft Laboratories Inc. , 874 F.2d 804, 10 USPQ2d 1843 (Fed. Cir.),

cert. denied , 493 U.S. 975 (1989); In re Kulling , 897 F.2d 1147, 14 USPQ2d 1056 (Fed. Cir. 1990), MPEP 2144.05).

3. Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Heimanson et al (USPat. 5,775,416) and Gilchrist et al (USPat. 5,846,375) in view of McMillin et al (USPat. 5,835,334). Heimanson and Gilchrist are discussed above. Heimanson further teaches a stainless steel member (36a, Figures 1,3; column 3, lines 33-37) provided between a conducting part (24, column 3, lines 33-37) and the cooling block (34/36b, Figure 1,3). As a result, Heimanson does not teach his stainless steel member as being made from an electrically insulating material such as aluminum nitride which is taught in the specification (Page 28, lines 9-10) to have the prescribed coefficient of thermal conductivity of 80W/mk. Heimanson and Gilchrist do not teach an insulating member that divides the heat transfer space into an upper and a lower space.

McMillin teaches a variable high temperature chuck used in high density plasma operations (title, Figure 1). Specifically, McMillin teaches an electrically insulating material being aluminum nitride as a component of the chuck (column 3, lines 40-45).

It would have been obvious to one of ordinary skill in the art at the time the invention was made for Heimanson and Gilchrist to replace the stainless steel member (36a) of Heimanson and Gilchrist with aluminum nitride as taught by McMillin.

Motivation for Heimanson and Gilchrist to replace the stainless steel member (36a) of Heimanson and Gilchrist with aluminum nitride as taught by McMillin is to provide for an alternate material of construction.

It would have been obvious to one of ordinary skill in the art at the time the invention was made for Heimanson and Gilchrist to replace Heimanson's cooling block (34/36b, Figure 1,3) with Gilchrist's cooling block (15, Figure 1) and provide additional o-ring seals (Heimanson item 44, Figure 1) between the cooling block and the stainless steel members such that an insulating member divides the heat transfer space into an upper and a lower space.

Motivation for Heimanson and Gilchrist to replace Heimanson's cooling block with Gilchrist's cooling block is to provide enhanced heat transfer control as taught by Gilchrist (column 4, lines 18-45).

Motivation for Heimanson and Gilchrist to provide additional o-ring seals between the cooling block and the stainless steel members such that an insulating member divides the heat transfer space into an upper and a lower space is for providing additional convective heat transfer (column 4, lines 4-15).

4. Claims 7 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Heimanson et al (USPat. 5,775,416) and Gilchrist et al (USPat. 5,846,375) in view of Shamouilian et al (USPat. 5,745,331). Heimanson and Gilchrist are discussed above. However, Heimanson and Gilchrist do not teach a surface roughness of a member defining the heat transfer space as being smaller than 2.0μm. Shamouilian teaches a similar electrostatic chuck with a heat transfer space defined by a member (80; Figure 2a). Specifically, Shamouilian teaches a surface roughness of his member defining the heat transfer space as being smaller than 2.0μm (column 8, lines 45-65).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to machine the member defining the heat transfer space of Heimanson to a surface roughness of smaller than 2.0μm as taught by Shamouilian.

Motivation to machine the member defining the heat transfer space of Heimanson to a surface roughness of a smaller than 2.0μm is to enhance heat transfer as taught by Shamouilian (column 8, lines 55-60).

5. Claims 11, 12, 23, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Heimanson et al (USPat. 5,775,416), as applied to claims 2, 14, 25, 29, 30, 31, 37, 40, and 41 above, and further in view of Sherman (USPat. 5,535,090) and Mori et al (USPat. 5,935,460). Heimanson and Gilchrist are discussed above. However, Heimanson and Gilchrist do not teach metallic seal members and metallic seal members with a fluoride passivation film providing a corrosion resistant film made of nickel fluoride. Sherman teaches a similar electrostatic chuck (Figure 1) including seal members (28) that can be metallic (column 6, lines 45-48). However, Sherman does not teach metallic seal members with a fluoride passivation film providing a corrosion resistant film made of nickel fluoride. Mori teaches a plasma machining apparatus (Figure 1; column 4, lines 14-41). Specifically, Mori teaches a nickel fluoride insulator coating (34; Figure 32b; column 21, lines 44-54) over a plasma facing surface of an electrode (1).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to replace Heimanson's organic seal member (44) with a nickel fluoride protected metallic seal member as taught by Sherman and Mori.

Motivation to replace Heimanson's organic seal member with a nickel fluoride protected metallic seal member as taught by Sherman and Mori is to provide protection from fluorine gas as discussed by Mori (column 21, lines 45-50).

6. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Heimanson et al (USPat. 5,775,416) , as applied to claims 2, 14, 25, 29, 30, 31, 37, 40, and 41 above, and further in view of Sherman (USPat. 5,535,090) and Mori et al (USPat. 5,935,460). Heimanson and Gilchrist are discussed above. However, Heimanson and Gilchrist do not teach metallic seal members and metallic seal members covered by a soft metal film made of a material having a softening point lower than a process temperature of the object to be processed. Sherman teaches a similar electrostatic chuck (Figure 1) including seal members (28) that can be metallic (column 6, lines 45-48). However, Sherman does not teach metallic seal members covered by a soft metal film made of a material having a softening point lower than a process temperature of the object to be processed. Mori teaches a plasma machining apparatus (Figure 1; column 4, lines 14-41). Specifically, Mori teaches a nickel fluoride insulator coating (34; Figure 32b; column 21, lines 44-54) over a plasma facing surface of an electrode (1) which is a soft metal film made of a material having a softening point lower than a process temperature of the object to be processed. It would have been obvious to one of ordinary skill in the art at the time the invention was made to replace Heimanson's organic seal member (44) with a nickel fluoride protected metallic seal member which is a soft metal film made of a material having a softening point lower than a process temperature of the object to be processed as taught by Sherman and Mori.

Motivation to replace Heimanson's organic seal member with a nickel fluoride protected metallic seal member which is a soft metal film made of a material having a softening point lower than a

process temperature of the object to be processed, as taught by Sherman and Mori, is to provide protection from fluorine gas as discussed by Mori (column 21, lines 45-50).

7. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Heimanson et al (USPat. 5,775,416) and Gilchrist et al (USPat. 5,846,375) in view of Niori et al (USPat. 5,800,618). Heimanson and Gilchrist are discussed above. Heimanson and Gilchrist do not teach an electrode unit having a ceramic heater unit therein. Niori teaches a plasma generating body (14, Figure 4) including an electrode (15) and heater (19) that are both embedded in ceramic substrate (18; column 14, lines 45-67).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to replace Heimanson and Gilchrist's stainless steel plate with a heater unit therein with Niori's plasma generating body including an electrode and heater that are both embedded in ceramic substrate.

Motivation to replace Heimanson and Gilchrist's stainless steel plate with a heater unit therein with Niori's plasma generating body including an electrode and heater that are both embedded in ceramic substrate is to provide corrosion resistance as taught by Niori (column 8, lines 33-50).

8. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Heimanson et al (USPat. 5,775,416) and Gilchrist et al (USPat. 5,846,375) in view of Ishii (USPat. 5,529,657). Heimanson and Gilchrist are discussed above. However, Heimanson and Gilchrist do not teach that the electrode structure is an upper electrode unit positioned above the object to be processed. Ishii teaches a similar electrode structure (4, Figure 20) which is an upper electrode unit positioned above the object ("W") to be processed.

It would have been obvious to one of ordinary skill in the art at the time the invention was made for Ishii to replace his upper electrode structure with that structure of Heimanson and Gilchrist. Motivation for Ishii to replace his upper electrode structure with that structure of Heimanson and Gilchrist is to provide improved temperature control as taught by Heimanson and Gilchrist (above).

9. Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Heimanson et al (USPat. 5,775,416) in view of Sherman (USPat. 5,535,090), McMillin et al (USPat. 5,835,334), and Gilchrist et al (USPat. 5,846,375). Heimanson is discussed above. Heimanson does not teach seal members that are metallic. Sherman teaches a similar electrostatic chuck (Figure 1) including seal members (28) that can be metallic (column 6, lines 45-48). Heimanson does not teach Heimanson's stainless steel member as being made from an electrically insulating material such as aluminum nitride which is taught in the specification (Page 28, lines 9-10) to have the prescribed coefficient of thermal conductivity of 80W/mk. Heimanson does not teach that an insulating member divides the heat transfer space into an upper and a lower space. McMillin teaches a variable high temperature chuck used in high density plasma operations (title, Figure 1). Specifically, McMillin teaches an electrically insulating material being aluminum nitride as a component of the chuck (column 3, lines 40-45).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to replace Heimanson's organic seal member (44) with a metallic seal member as taught by Sherman.

Motivation to replace Heimanson's organic seal member with a metallic seal member is to provide for an alternate material of construction as taught by Sherman.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use aluminum nitride material instead of Heimanson's stainless steel for an insulating member as taught by McMillin.

Motivation to use aluminum nitride material instead of stainless steel for an insulating member as taught by McMillin is to provide for an alternate material of construction.

It would have been obvious to one of ordinary skill in the art at the time the invention was made for Heimanson, Sherman, and McMillin to provide additional o-ring seals (Heimanson item 44, Figure 1) between the cooling block and the aluminum nitride insulating member such that the insulating member divides the heat transfer space into an upper and a lower space.

Motivation for Heimanson, Sherman, and McMillin to provide additional o-ring seals (Heimanson item 44, Figure 1) between the cooling block and the aluminum nitride insulating member such that the insulating member divides the heat transfer space into an upper and a lower space is to provide additional heat transfer control as demonstrated by Gilchrist (column 4, lines 18-45).

10. Claim 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over Heimanson et al (USPat. 5,775,416) in view of Gilchrist et al (USPat. 5,846,375) and McMillin et al (USPat. 5,835,334). Heimanson and Gilchrist are discussed above. Heimanson and Gilchrist do not teach Heimanson's stainless steel member as being made from an electrically insulating material such as aluminum nitride which is taught in the specification (Page 28, lines 9-10) to have the prescribed coefficient of thermal conductivity of 80W/mk. Heimanson and Gilchrist do not teach that an insulating member divides the heat transfer space into an upper and a lower space. McMillin teaches a variable high temperature chuck used in high density plasma operations

(title, Figure 1). Specifically, McMillin teaches an electrically insulating material being aluminum nitride as a component of the chuck (column 3, lines 40-45).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use aluminum nitride material instead of Heimanson's stainless steel for an insulating member as taught by McMillin.

Motivation to use aluminum nitride material instead of stainless steel for an insulating member as taught by McMillin is to provide for an alternate material of construction.

It would have been obvious to one of ordinary skill in the art at the time the invention was made for Heimanson, Gilchrist, and McMillin to provide additional o-ring seals (Heimanson item 44, Figure 1) between the cooling block and the aluminum nitride insulating member such that the insulating member divides the heat transfer space into an upper and a lower space.

Motivation for Heimanson, Gilchrist, and McMillin to provide additional o-ring seals (Heimanson item 44, Figure 1) between the cooling block and the aluminum nitride insulating member such that the insulating member divides the heat transfer space into an upper and a lower space is to provide additional heat transfer control as demonstrated by Gilchrist (column 4, lines 18-45).

11. Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Heimanson et al (USPat. 5,775,416) in view of Sherman (USPat. 5,535,090) and Husain et al (USPat. 5,548,470). Heimanson and Sherman are discussed above. However, Heimanson and Sherman do not teach a contact rate between interfacing surfaces of the structures described above. Husain teaches an electrostatic chuck (Figure 2A) including teachings of how interfacial contact area fractions can

influence heat transfer rates and thus the control of the wafer temperature (column 2, lines 21-49; column 7, lines 50-55).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to vary the contact rate between interfacing surfaces of the structures of Heimanson and Sherman, described above, as taught by Husain.

Motivation to vary the contact rate between interfacing surfaces of the structures of Heimanson and Sherman, described above, as taught by Husain is to influence the heat transfer between the parts (column 9, lines 45-50).

12. Claims 35 and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Heimanson et al (USPat. 5,775,416) and Gilchrist et al (USPat. 5,846,375) in view of Husain et al (USPat. 5,548,470). Heimanson and Gilchrist are discussed above. However Heimanson and Gilchrist do not teach a contact rate between interfacing surfaces of the structures described above. Husain teaches an electrostatic chuck (Figure 2A) including teachings of how interfacial contact area fractions can influence heat transfer rates and thus the control of the wafer temperature (column 2, lines 21-49; column 7, lines 50-55).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to vary the contact rate between interfacing surfaces of the structures of Heimanson and Gilchrist, described above, as taught by Husain.

Motivation to vary the contact rate between interfacing surfaces of the structures of Heimanson and Gilchrist, described above, as taught by Husain is to influence the heat transfer between the parts (column 9, lines 45-50).

13. Claims 36 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Heimanson et al (USPat. 5,775,416) in view of Sherman (USPat. 5,535,090). Heimanson is discussed above. However, Heimanson does not teach metallic seal members. Sherman teaches a similar electrostatic chuck (Figure 1) including seal members (28) that can be metallic (column 6, lines 45-48).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to replace Heimanson's organic seal member (44) with a metallic seal member as taught by Sherman.

Motivation to replace Heimanson's organic seal member with a metallic seal member as taught by Sherman is to provide for an alternate material of construction.

14. Claim 39 is rejected under 35 U.S.C. 103(a) as being unpatentable over Heimanson et al (USPat. 5,775,416) and Gilchrist et al (USPat. 5,846,375) in view of Sherman (USPat. 5,535,090). Heimanson, Sherman, and Gilchrist are discussed above. Heimanson and Gilchrist do not teach a metallic seal member. Sherman teaches a similar electrostatic chuck (Figure 1) including seal members (28) that can be metallic (column 6, lines 45-48).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to replace Heimanson's organic seal member (44) with a metallic seal member as taught by Sherman.

Motivation to replace Heimanson's organic seal member with a metallic seal member as taught by Sherman is to provide for an alternate material of construction.

15. Claim 42 is rejected under 35 U.S.C. 103(a) as being unpatentable over Heimanson et al (USPat. 5,775,416), Sherman (USPat. 5,535,090), and Gilchrist et al (USPat. 5,846,375) in view

of Lei et al (USPat. 5,556,476). Heimanson, Sherman, and Gilchrist are discussed above. Heimanson, Sherman, and Gilchrist do not teach a gas blower to provide a release of heat. Lei teaches similar substrate support means (Figure 2) including a blower to provide a release of heat (column 8, lines 49-60).

It would have been obvious to one of ordinary skill in the art at the time the invention was made for to add a blower to the apparatus of Heimanson, Sherman, and Gilchrist as taught by Lei.

Motivation to add a blower to the apparatus of Heimanson, Sherman, and Gilchrist as taught by Lei is to maintain chamber components cooled.

16. Claims 43 and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Heimanson et al (USPat. 5,775,416), Gilchrist et al (USPat. 5,846,375) in view of Lei et al (USPat. 5,556,476). Heimanson and Gilchrist are discussed above. Heimanson and Gilchrist do not teach a gas blower to provide a release of heat. Lei teaches similar substrate support means (Figure 2) including a blower to provide a release of heat (column 8, lines 49-60).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add a blower as taught by Lei.

Motivation for Heimanson and Gilchrist to add a blower as taught by Lei is to maintain chamber components cooled.

Response to Arguments

17. Applicant's arguments filed March 18, 2003 have been fully considered but they are not persuasive.

18. Applicant's position that Heimanson teaches a "simple space" for 50, Figure 1 and with respect to claims 35 and 44, rather than the Examiner's opinion of a heat transfer space 50 is not

persuasive. In particular, Heimanson specifically states that Applicant's "simple space" is indeed used by Heimanson as a heat transfer space (column 4, lines 4-15). However, Heimanson does not teach a heat transfer space (50) formed by a concentric or spiral groove or is a labyrinth heat transfer space. For this reason, Gilchrist is introduced who teaches an electrode unit (15, Figure 1) that interfaces with the substrate, and specifically teaches a labyrinth transfer space (32A-D; Figure 1) formed by concentric (Figure 2, 5) grooves. The heat transfer space is divided into concentric zones (32A-D; Figure 1) controllable on an individual basis (column 4, lines 35-45). Further, Gilchrist teaches a high-frequency source (30) applying a high-frequency voltage to an electrode unit (14).

19. Applicant's position that Gilchrist "does not disclose or suggest that the conduits are formed on a surface of the cooling block" is not convincing. In particular, Gilchrist clearly teaches that his conduits (32a-d; Figure 1) are formed on an inner surface of the cooling block (15).

20. Applicant's position that Gilchrist "does not disclose or suggest the labyrinth heat transfer formed by concentric or spiral groove provided on at least one of opposite surfaces of the electrode unit and the cooling block...placement table" is not convincing. In particular, Gilchrist further teaches the labyrinth heat transfer (32A-D; Figure 1) formed by concentric (Figure 2, 5) grooves. Applicant's invention is arrived at when one of ordinary skill in the art at the time the invention was made replaces Heimanson's heat transfer space with Gilchrist's labyrinth heat transfer space provided on at least one of opposite surfaces of the electrode unit and the cooling block as addressed above.

21. In response to applicant's argument that there is no suggestion to combine the references of Heimanson et al (USPat. 5,775,416) in view of Gilchrist et al (USPat. 5,846,375), the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the Examiner has identified that there is teaching (as outlined above), suggestion, and motivation to combine the references and is found both in the references themselves and in the knowledge generally available to one of ordinary skill in the art. In a broad sense, Heimanson and Gilchrist are both concerned with controlling the temperature of a substrate as outlined above. Further, both Heimanson and Gilchrist each provide teaching of how to impart this temperature control as outlined above. In this sense, both Heimanson and Gilchrist share a common problem and Gilchrist provides motivation to improve Heimanson's control over his substrate temperature by the structure of Gilchrist's labyrinth transfer space (32A-D; Figure 1) formed by concentric (Figure 2, 5) grooves. The heat transfer space is divided into concentric zones (32A-D; Figure 1) controllable on an individual basis (column 4, lines 35-45). Specifically, motivation to form Heimanson's heat transfer space 50 in the form of Gilchrist's labyrinth transfer space is to optimize temperature control for a particular etching or deposition process as taught by Gilchrist (column 4, lines 49-54). Further, it would be obvious to those of ordinary skill in the art to optimize the operation of the claimed invention (In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980); In re Hoeschele , 406 F.2d 1403, 160 USPQ 809

(CCPA 1969); Merck & Co. Inc . v. Biocraft Laboratories Inc. , 874 F.2d 804, 10 USPQ2d 1843 (Fed. Cir.), cert. denied , 493 U.S. 975 (1989); In re Kulling , 897 F.2d 1147, 14 USPQ2d 1056 (Fed. Cir. 1990), MPEP 2144.05).

22. Regarding claims 11, 12, 23, and 24, it was conceded by the Examiner that Sherman does not teach metallic seal members with a fluoride passivation film providing a corrosion resistant film made of nickel fluoride. For this reason, Sherman was introduced for teaching a similar electrostatic chuck (Figure 1) including seal members (28) that can be metallic (column 6, lines 45-48). However, Sherman does not teach metallic seal members with a fluoride passivation film providing a corrosion resistant film made of nickel fluoride. For this reason, Mori was presented for teaching a plasma machining apparatus (Figure 1; column 4, lines 14-41). Specifically, Mori teaches a nickel fluoride insulator coating (34; Figure 32b; column 21, lines 44-54) over a plasma facing surface of an electrode (1). Further, it was stated that it would have been obvious to one of ordinary skill in the art at the time the invention was made to replace Heimanson's organic seal member (44) with a nickel fluoride protected metallic seal member as taught by Sherman and Mori.

23. In response to applicant's argument that there is no suggestion to combine the references of Heimanson et al (USPat. 5,775,416), as applied to claims 2, 14, 25, 29, 30, 31, 37, 40, and 41 above, and further in view of Sherman (USPat. 5,535,090) and Mori et al (USPat. 5,935,460), the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5

USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, it was stated that there is teaching, suggestion, and motivation to do so found both in the references themselves and in the knowledge generally available to one of ordinary skill in the art. In particular, motivation to combine the references of Heimanson et al (USPat. 5,775,416), as applied to claims 2, 14, 25, 29, 30, 31, 37, 40, and 41 above, and further in view of Sherman (USPat. 5,535,090) and Mori et al (USPat. 5,935,460) is to provide protection from fluorine gas as discussed by Mori (column 21, lines 45-50) as originally stated.

24. With respect to Applicant's argument to claims 13, 15, 32, 33, 34, 36, 38, 39, and 42 Applicant is directed to the body of the above claim rejection.

25. With respect to claims 32, 33 Applicant states that "Heimanson is silent about an electrode unit having a heater unit therein", however, as stated prior, Heimanson teaches an electrode structure ("chuck", 20) with a conductor unit (24, "stainless steel"; column 3, lines 24-25) and placement table (Figure 1) having a heater unit (28) therein. However, Heimanson et al does not teach a high-frequency source applying a high-frequency voltage to Heimanson's conducting unit. For this reason Gilchrist was introduced for teaching an electrode unit (15, Figure 1) that interfaces with the substrate, and a high-frequency source (30) applying a high-frequency voltage to an electrode unit (14). Further, it would have been obvious to one of ordinary skill in the art at the time the invention was made for Heimanson and Gilchrist to replace Heimanson's cooling block (34/36b, Figure 1,3) with Gilchrist's cooling block (15, Figure 1) and provide additional o-ring seals (Heimanson item 44, Figure 1) between the cooling block and the stainless steel members <u>such that an insulating member divides the heat transfer space into an upper and a lower space</u>. The Examiner maintains that motivation for Heimanson

and Gilchrist to replace Heimanson's cooling block with Gilchrist's cooling block is to provide enhanced heat transfer control as taught by Gilchrist (column 4, lines 18-45).

26. With respect to claims 42, 43, and 45, Applicant states that Lei "does not promote release of heat by blowing a gas toward a back surface of an electrode unit". This is not convincing. Lei teaches similar substrate hollow support means (Figure 2) including a blower to provide a release of heat (column 8, lines 49-60). Motivation to add a blower to the apparatus of Heimanson, Sherman, and Gilchrist as taught by Lei is to maintain chamber components cooled as taught by Lei (column 8, lines 49-60).

Conclusion

27. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

28. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Rudy Zervigon whose telephone number is (703) 305-1351. The examiner can normally be reached on a Monday through Thursday schedule from 8am through 7pm. The official after final fax phone number for the 1763 art unit is (703) 872-9311. The official before final fax phone number for the 1763 art unit is (703) 872-9310. Any Inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Chemical and Materials Engineering art unit receptionist at (703) 308-0661. If the examiner can not be reached please contact the examiner's supervisor, Gregory L. Mills, at (703) 308-1633.

JEFFRIE R. LUND
PRIMARY EXAMINER